Richmond Refinery LPS Bulletin-Reliability

B&S - Jet Line Piping Overpressure

IMPACT ERM LI#38032
Investigation # 23397

Location:
21 Pump Station -B&S Division

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Picture of the failed 8" JP5 piping.

This is an example of poor design for buried piping systems; this JP5 line was in similar condition.

Tenets of Operations Violated:

#2 – Always operate in safe and controlled condition.

#10- Always involve the right people in decisions that affect procedures and equipment.

Incident Description:

On May 21, 2012, routine piping replacement work was planned for the 14 Gas line at 21 PS. Part of the isolation plan to perform the work was to isolate and drain the inactive JP5 line that was still full of product. The isolation plan would temporarily isolate the JP5 line from the thermal relief device located upstream of the isolation valve.

During line isolation, it was found that the drain valve on the JP5 line was plugged and several attempts to unplug the valve were unsuccessful. After three hours of being isolated, contractors working nearby the 8" JP5 line heard an explosion and noted jet leaking from the buried piping located under Midway St. This leak resulted in 3.5bbls of jet spilled to secondary containment, however, no injuries or exposures occurred as a result of this incident.

Investigation Findings:

1) The buried piping failed as a result of external corrosion. With very thin piping and no thermal relief for a short period of time, the piping ruptured.
2) The JP5 line was installed using past practices of using an old pipe as a pipe sleeve under road crossings. This old pipe sleeve had failed and allowed soil and water to enter into the sleeve and come into contact with the JP5 piping. The presence of soil and water caused external corrosion of the JP5 line.
3) Several piping runs, including the pipe that failed, are still packed with product that were apart of the JP5 Filter system. No proper air gapping or flushing of the piping was performed when the system was taken out of service 15 years ago.

Lessons Learned:

1) B&S has an existing inspection program for buried piping and this work is prioritized based on the type of product in the piping. Currently, inactive piping systems are not given high priority status.
2) Stop work authority could have been utilized when the JP5 line could not be drained.

Recommendations:

1) Reinforce the current buried piping standards found in Chevron Engineering Standards so that future installation is conducted in accordance with today's standards.
2) Continue with current buried piping inspection program, however, the team will now survey the conditions of all pipe sleeves in the surrounding area regardless of whether there is any product in the line or whether the pipe system is active to help identify any piping system that maybe experiencing external corrosion.
3) B&S shall develop and implement a plan to empty and clean the remaining systems that are currently out of service and require air gapping.
4) Reinforce the importance of stop work authority to all personnel.